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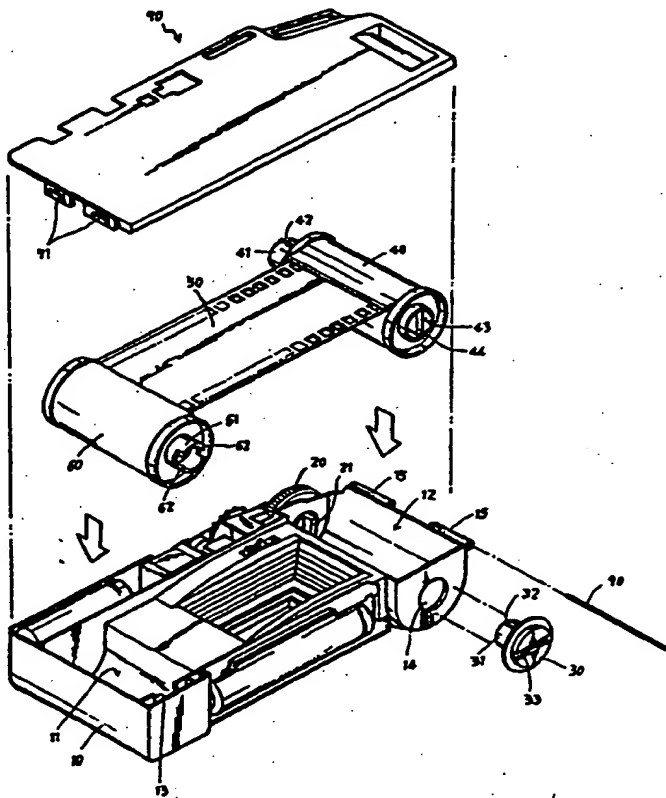
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(54) Title: RECYCLABLE CAMERA

## (57) Abstract

A recyclable camera according to the present invention includes: a casing (10) having first and second space portions (11, 12) which are formed on the left and right sides thereof, a cut-off opening (13), a first groove, a first hole (14) having a predetermined diameter, a protrusion (21) which is formed on the upper portion of the second space portion (12), a winding knob (20), and two or more pipes (15) which are formed to be integrated with the outside end of the right side of the second space portion (12); a first reel of film (60) having a roll of film (50) which is rolled inwardly on the whole of left end thereof and a face-inserted portion which is formed on the left and right sides of a first protrusion pipe (61), respectively: a second reel of film (40) having the roll of film which is inserted inwardly on the right end thereof, a second longitudinal groove (42) which is formed on the central portion of a second protrusion pipe (41), and a longitudinal projection (44) which is formed on a second hole (43) on the opposite side of the second protrusion pipe (41); a cover (70) having a pipe having a length and two inclined projections (71); and a finishing winding knob (30) having a third groove (33) which is formed on the outside thereof, a fourth longitudinal groove (32) which is formed on the opposite side to the third groove (33), and a projection (31) which is formed on the center portion thereof and is inserted into the first hole (14) to be thereby inserted into the second hole (43) of the second reel (40) of film (50).



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## RECYCLABLE CAMERA

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

The present invention relates to a recyclable camera.

## 2. Discussion of the Prior Art

As widely known, a camera for the use of one time has been habitually used in a worldwide scope by the following advantages: firstly, a roll of film is already inserted into a casing of the camera, so a user can use the camera in a simple manner; secondly, the camera can be purchased at a low cost; thirdly, upon completing photographing, the user can deposit the camera itself in a development room to develop the film, without drawing the film from the casing; and finally, the user can purchase the camera at any time and in any place, without any problem. However, since the camera for the use of one time is elaborately manufactured, the user is likely to discard the camera, reluctantly. Recently, the cameras for the use of one time are

collected and recycled in view of recycling of resources and for economic reasons. If well treated, however, a conventional camera for the use of one time can be recycled one or two times, but it is general that it can not be recycled two times or more. In other words, there occurs a problem that the conventional camera for the use of one time is manufactured in an elaborate manner, but is not stable structurally. Referring to FIG. 2, an explanation of the construction of the conventional camera for the use of one time will be discussed hereinafter. FIG. 2 is an exploded perspective view illustrating construction of a conventional camera for the use of one time. A casing 100 includes a lens, a shutter device, a circuit substrate, a flash device and a battery in its internal space and forms two space portions 101 and 102 at left and right sides thereof. At the time, a roll of film 300 which is already rolled is inserted into the space portion 101(based upon FIG. 2) at the left side of the casing 100, without being inserted into a separate depositing device, and a reel of film 200 in which the other end of the rolled film 300 is secured is inserted into the space portion 102 at the right side of the casing 100. If an opening 104 which is formed on the bottom portion of the space portion 102 does not exist, the reel of film 200 can not be inserted into the space portion 102 because of the formation of a

protrusion pipe 201 on the reel of film 200. In other words, in the construction of the conventional camera for the use of one time, the reel of film 200 can not be directly inserted towards a lower direction from an upper direction of the space portion 102. In more detail, since a gear tooth is formed on the inward portion of the protrusion pipe 201 of the reel of film 200 and is assembled with a tooth which is protrudedly formed on a winding knob 110, the reel of film 200 has to be inserted to the upper direction from the down direction of the space portion 102 via the opening 104. On the other hand, the opening 104 is adapted to draw the reel of film 200, when the camera is deposited in a development room after completion of photographing. As mentioned above, the reel of film 200 and the rolled film are each inserted into the space portions 101 and 102, and a cover 400 is then assembled on the upper portion of the casing 100(based upon FIG. 2). At the time, at the left and right sides on the bottom end of the cover 400, protrusion plates 402 and 401 are integrated with the cover 400. In this case, the protrusion plate 402 at the left side on the bottom end of the cover 400 is adapted to close a cut-off opening 103 which is connected with the spacing portion 101 on the left side of the casing 100, and the protrusion plate 401 at the right side on the bottom end of the cover 400 is

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adapted to close the opening 104. Next, if a body of the camera is wrapped with wrapping paper, the process of manufacturing the camera for the use of one time can be finally completed. After use of the camera, if the camera is deposited in a development room, the wrapping paper is unwrapped and the protrusion plate 401 is lifted upwardly by means of a tool having a thin end, such as a driver, to draw the reel of film 200 through the opening 104. For recycling of the camera for the use of one time, the cover 400 is separated from the casing 100 and a new roll of film and a new reel of film are each inserted into the space portions 101 and 102 on the casing 100 in the same manner as mentioned above. Next, the cover 400 is closed and the protrusion plate 401 which has been opened is then closed. Then, the opening 104 is sealed and the body of camera is wrapped. However, since the protrusion plate 401 is moulded to be integrated with the cover 400, once it is opened, it can not be well connected to the cover 400. Therefore, the camera for the use of one time can be recycled one or two times, but can not be recycled two times or more. If the protrusion plate 401 is separated from the cover 400 and is then cut off, the cover 400 itself should be replaced by a new cover. Moreover, since the cover 400 is assembled with the casing 100 not by means of screws, but in a concave-convex shape, if the cover 400 is separated from

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the casing 100 one or two times, there occurs a problem that the cover 400 is likely to be easily destroyed. To solve the above problem, the side portion of the opening 104 is constructed in a door form and a part of the cover 400, that is, the upper portion of the reel of film 200 is designed in a door form. However, the camera for the use of one time, which has the door form of construction, exhibits a weak durability. So the cameras for the use of one time which are currently on the market can be recycled at least one or two times after the completion of one-time use.

Moreover, in all of cameras for the use of one time which are currently on the market, the reel of film 200 is inserted into one space portion and the rolled film 300 is inserted into the other space portion. In this case, there is a disadvantage that the rolled film 300 which is deposited in the casing 100 is readily exposed to heat or moisture. Therefore, if a long period of time elapses after manufacturing the product, the rolled film 300 is deteriorated and exhibits a low degree of photosensitivity, which shows limitation in using the camera for the use of one time.

#### SUMMARY OF THE INVENTION

An object of the present invention is to provide a recyclable camera

having a roll of film which can not be deteriorated even in the state where it is inserted into the camera for a long period of time.

Another object of the present invention is to provide a recyclable camera which can be recycled several times or more.

To achieve these and other objects according to the present invention, there is provided a recyclable camera including: a casing 10 comprising space portions 11 and 12 which are formed on the left and right sides thereof, the space portions 11 and 12 each having open upper portions, a cut-off opening 13 which is formed on the inwardly bottom portion of the space portion 11 on the left side thereof, two grooves 16 which are formed on the inner side of the space portion 11, a hole 14 having a predetermined diameter which is formed on the bottom portion of the space portion 12 on the right side thereof, a protrusion 21 which is formed on the upper portion of the space portion 12 and is assembled with a winding knob 20 to be protruded towards the space portion 12, and two pipes 15 into which a wire 90 is each inserted are formed to be integrated with the outside end of the right side of the space portion 12; a first reel of film 60 comprising a roll of film 50 which is rolled inwardly on the whole of left end thereof, and a face-inserted portion 60 which is formed on the left and right sides of a protrusion pipe



61, respectively, the protrusion pipe 61 being formed downwardly, the face-inserted portion 60 being inserted into the cut-off opening 13, while the whole of the reel of film 60 is inserted into the space portion 11; a second reel of film 40 comprising the roll of film 50 which is inserted inwardly on the right end thereof, a longitudinal groove 42 which is formed on the central portion of a protrusion pipe 41, the protrusion pipe 41 being formed upwardly, and a longitudinal projection 44 which is formed on a hole 43 on the opposite side of the protrusion pipe 41; a cover 70 comprising a pipe having a length which is inserted between the casing 10 and the pipe 15 to be integrated with the right end thereof, so the pipe can be opened and closed with the casing 10 in a hinge fashion, two inclined projections 71 which are formed on the opposite side thereof and are inserted into the groove 16 of the casing 10 to be assembled with the casing 10; and a finishing winding knob 30 comprising a groove 33 which is formed on the outside thereof, a longitudinal groove 32 which is formed on the opposite side to the groove 33, and a projection 31 which is formed on the center portion thereof and is inserted into a hole 14 to be thereby inserted into the hole 43 of the second reel of film 40.

Preferably, the roll of film 50 forms cut off lines 51 symmetrically on

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the adjacent portion to the end portion rolled into the first reel of film 60 and forms a connection portion 52 having a width of about 1mm or less on the portion where the symmetrical cut off lines 51 are met inwardly. Otherwise, the roll of film 50 forms an inclined cut off line 51a which connects its own inward end portion to a hole 54a and forms a cut off line 51b having a short length on the opposite side to the inclined cut off line 51a, and a connection portion 52a having a width of about 1mm or less on the portion where the inclined cut off line 51a and the cut off line 51b are met to each other.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and aspects of the invention will become apparent from the following description of embodiments with reference to the accompanying drawings in which:

FIG. 1 is an exploded perspective view illustrating construction of a recyclable camera embodied according to the principles of the present invention:

FIG. 2 is an exploded perspective view illustrating construction of a conventional camera for the use of one time:

FIG. 3 is a state view in which a roll of film is inserted into the conventional camera for the use of one time;

FIG. 4 is a state view in which a roll of film is inserted into the recyclable camera embodied according to the principles of the present invention;

FIG. 5 is a sectional view illustrating main parts of the recyclable camera embodied according to the principles of the present invention;

FIGS. 6 and 7 are views each illustrating the rolls of film which are used in the recyclable camera embodied according to the principles of the present invention; and

FIG. 8 is a state view in which a cover is assembled with a casing in the recyclable camera embodied according to the principles of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, an explanation on the construction and operation of the recyclable camera embodied according to the principles of the present invention will be in detail discussed with reference to accompanying drawings. However, it should be noted that an explanation of parts necessary

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for the understanding of the present invention will be discussed hereinafter, and an explanation of parts except them will be excluded in this description for the sake of brevity.

In a preferred embodiment of the present invention, a recyclable camera includes two reels of film 40 and 60, a finishing winding knob 30, and a cover 70 which is connected to a casing 10 in a hinge fashion to be opened and closed.

A roll of film 50, which is same or similar as/to that in FIG. 6 or FIG. 7, is wound into the left reel of film 60. In this case, a hole 53 is locked to a projection(not shown) which is formed on the reel of film 60, so that even if it is pulled with a strong force, the roll of film 50 can not be easily drawn to the outside. The end portion of right side of the roll of film 50 is wound into the reel of film 40 in the same manner as the conventional that. At this time, the left reel of film 60 is inserted into a spacing portion 11 of the left side of the casing 10 and the right reel of film 40 is inserted into a spacing portion 12 of the right side of the casing 10. A face-inserted portion 62, which is formed on a projection pipe 61 of the reel of film 60, is inserted into a cut-off opening 13 of the casing 10. As shown in FIG. 4, the reel of film 40 forms a groove 42 on a projection

pipe 41 into which a projection 21 on a winding knob 20 is inserted and is finally inserted into the spacing portion 12.

In this state, a projection 31 on the finishing winding knob 30 is inserted into a hole 14 until it is inserted into a hole 43 on the reel of film 40. At the time, a projection 44 on the hole 43 is inserted into a groove 32 on the projection 31, as shown in FIG. 5.

It is of course general that a pipe(not shown) on the cover 70 is connected to a pipe 15 on the casing 10 in a hinge fashion by means of a wire 90. As mentioned above, the two reels of film 40 and 60 are respectively inserted into the space portions 11 and 12 on the casing 10, and the finishing winding knob 30 is then assembled with the casing 10. Next, the inclined projection 71 on the cover 70 is inserted into the groove 16 on the space portion 11 and wrapping paper 80 is then attached to the assembled camera body. In this case, upon completing photographing, the winding knob 20 is wound to move the roll of film 50 mounted on the reel of film 60 to the other reel of film 40. If the roll of film 50 is fully inserted into the reel of film 40, the movement of the winding knob 20 can not allow the roll of film 50 to be moved to the reel of film 40. If the winding knob 20 is completely wound, the connection portion 52 or 52a on the roll of film 50

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will be cut off. The cutting of the connection portion 52 or 52a has no influence on the operation of camera. However, even if the width of the connection portion 52 or 52a is about 1mm or less, the movement of the winding knob 20 can not allow the roll of film 50 to be cut off because of a high internal tension of a film material. Typically, upon completion of the photographing, the camera is deposited in a development room. A tool having a thin end portion or a coin is inserted into the groove 33 on the finishing winding knob 30 and a strong force is then applied to the groove 33 to thereby rotate the finishing winding knob 30 in a clockwise direction. As a result, the projection 44 on the reel of film 40 rotates in the clockwise direction, while being inserted into the groove 32 on the projection 31, so that the whole of roll of film 50 is forcibly moved in the clockwise direction. Therefore, the connection portion 52 or 52a on the roll of film 50 is easily cut off, and if the finishing winding knob 30 is further rotates, since the connection portions 52 and 52a are cut off, the film remaining on the right sides(based upon FIGS. 6 and 7) on the connection portions 52 and 52a is all inserted into the reel of film 40. Next, the wrapping paper 80 is unwrapped and the cover 70 is detached from the casing 10. Then, the two reels of film 40 and 60 are drawn from the casing 10 and new reels of film 40

and 60 are respectively replaced on the positions of the space portions 11 and 12. Thereafter, the cover 70 is assembled to the casing 10, and the wrapping paper 90 is attached to the assembled camera. As a result, the camera can be recycled as a new camera.

In addition, the preferred embodiment of the present invention uses the roll of film 50 having the cut off line and the connection portion, but may use another roll of film which does not form a hole 53 on the end portion thereof. At this time, the roll of film is merely wound in the state where the end portion of roll of film is placed on the inner core(not shown) on the reel of film 60. In this case, since the recyclable camera according to the present invention will be used as a general camera for the use of one time, there is a need to form the finishing winding knob 30 and the projection 44 on the reel of film 40.

As clearly discussed above, a recyclable camera embodied according to the principles of the present invention has excellent advantages in that firstly, since one reel of film on which a roll of film is already wound and another reel of film on which the roll of film wound on the one reel of film is wound are mounted on the camera, the recyclable camera can prevent the roll of film from being deteriorated and at the same time prevent the

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photosensitivity of the roll of film from being reduced, even in the case where the recyclable camera is kept at a hot place for a long period of time or is exposed to the sunlight for many hours. and secondly, since the cover is connected to the casing in a hinge fashion, the cover and the casing can be opened and closed in a simple manner. such that they can not be easily destroyed and damaged. Furthermore, a recyclable camera embodied according to the principles of the present invention may be adapted to general cameras to thereby exhibit various embodiments.

Although a preferred form of the invention has been described, it will be understood by those skilled in the field that variations therefrom, and analogous uses, are within the knowledge of those skilled in the art. Accordingly, it is intended that the scope of the invention be defined, not by the scope of the foregoing description, but rather by the scope of the claims as interpreted in view of the pertinent prior art.



What Is Claimed Is:

1. A recyclable camera comprising:

a casing having first and second space portions which are formed on the left and right sides thereof, said first and second space portions each having open upper portions, a cut-off opening which is formed on the inwardly bottom portion of said first space portion on the left side thereof, a first groove which is formed on the inner sides of said first space portion, respectively, a first hole having a predetermined diameter, which is formed on the bottom portion of said second space portion on the right side thereof, a protrusion which is formed on the upper portion of said second space portion and is assembled with a winding knob to be protruded towards said second space portion, and two or more pipes into which a wire is each inserted are formed to be integrated with the outside end of the right side of said second space portion;

a first reel of film having a roll of film which is rolled inwardly on the whole of left end thereof, and a face-inserted portion which is formed on the left and right sides of a first protrusion pipe, respectively, said first protrusion pipe being formed downwardly, said face-inserted portion being inserted into said cut-off opening, while the whole of said first reel of

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film is inserted into said first space portion;

a second reel of film having said roll of film which is inserted inwardly on the right end thereof, a second longitudinal groove which is formed on the central portion of a second protrusion pipe, said second protrusion pipe being formed upwardly, and a longitudinal projection which is formed on a second hole on the opposite side of said second protrusion pipe;

a cover having a pipe having a length which is inserted between said casing and said pipe to be integrated with the right end thereof, so said pipe can be opened and closed with said casing in a hinge fashion and two inclined projections which are formed on the opposite side thereof and are inserted into said first groove of said casing to be assembled with said casing; and

a finishing winding knob having a third groove which is formed on the outside thereof, a fourth longitudinal groove which is formed on the opposite side to said third groove, and a projection which is formed on the center portion thereof and is inserted into said first hole to be thereby inserted into said second hole of said second reel of film.

2. The recyclable camera as claimed in claim 1, wherein said roll of film forms first cut off lines symmetrically on the adjacent portion to the

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end portions rolled into said first reel of film and forms a first connection portion having a width of about 1mm or less on the portion where the first cut off lines are met inwardly.

3. The recyclable camera as claimed in claim 1, wherein said roll of film forms an inclined cut off line which connects inward end portion thereof to a third hole and forms a second cut off line having a short length on the opposite side to said inclined cut off line, and a second connection portion having a width of about 1mm or less on the portion where said inclined cut off line and said second cut off line are met to each other.

4. A recyclable camera comprising:

a casing having first and second space portions which are formed on the left and right sides thereof, said first and second space portions each having open upper portions, a cut-off opening which is formed on the inwardly bottom portion of said first space portion on the left side thereof, a first groove which is formed on the inner sides of said first space portion, respectively, a protrusion which is formed on the upper portion of said second space portion and is assembled with a winding knob to be protruded towards said second space portion, and two or more pipes into which a wire is each inserted are formed to be integrated with the outside end of the right

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side of said second space portion;

a first reel of film having a roll of film which is rolled inwardly on the whole of left end thereof and a face-inserted portion which is formed on the left and right sides of a first protrusion pipe, respectively, said first protrusion pipe being formed downwardly, said face-inserted portion being inserted into said cut-off opening, while the whole of said first reel of film is inserted into said first space portion;

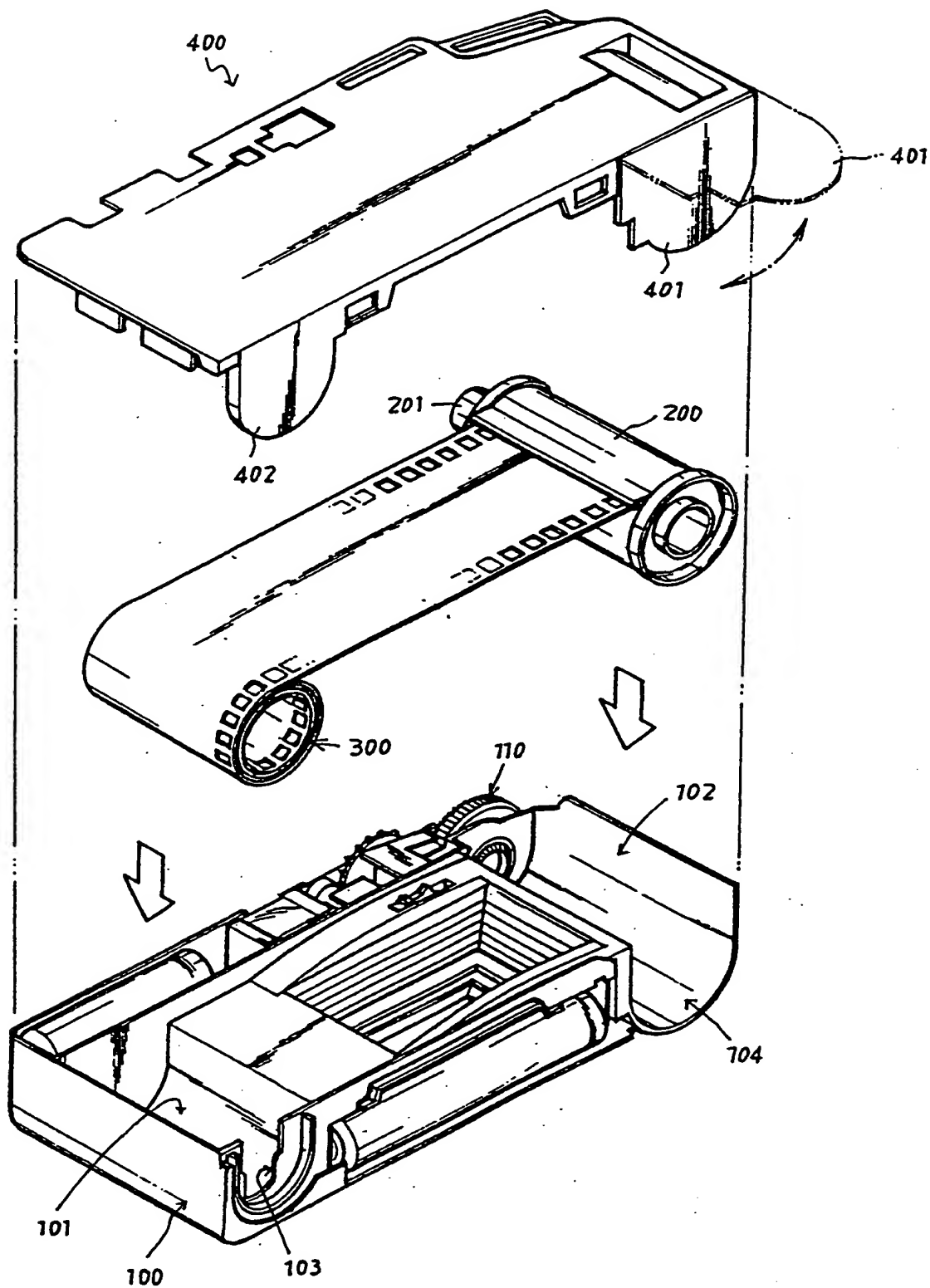
a second reel of film having said roll of film which is inserted inwardly on the right end thereof and a second longitudinal groove which is formed on the central portion of a second protrusion pipe, said second protrusion pipe being formed upwardly; and

a cover having a pipe having a length which is inserted between said casing and said pipe to be integrated with the right end thereof, so said pipe can be opened and closed with said casing in a hinge fashion and two inclined projections which are formed on the opposite side thereof and are inserted into said first groove of said casing to be assembled with said casing.



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FIG. 2



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Fig. 3

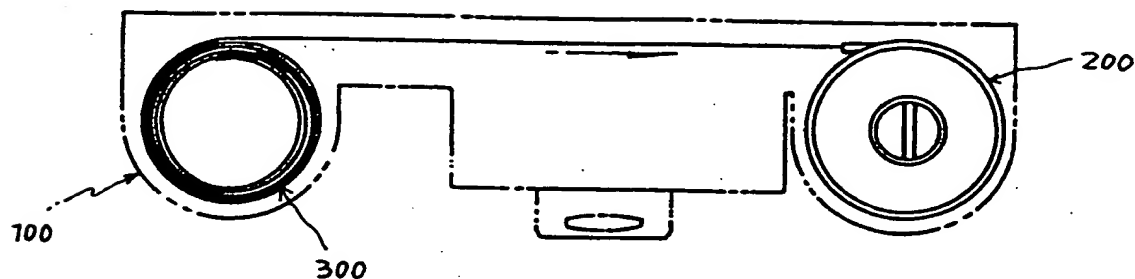


Fig. 4

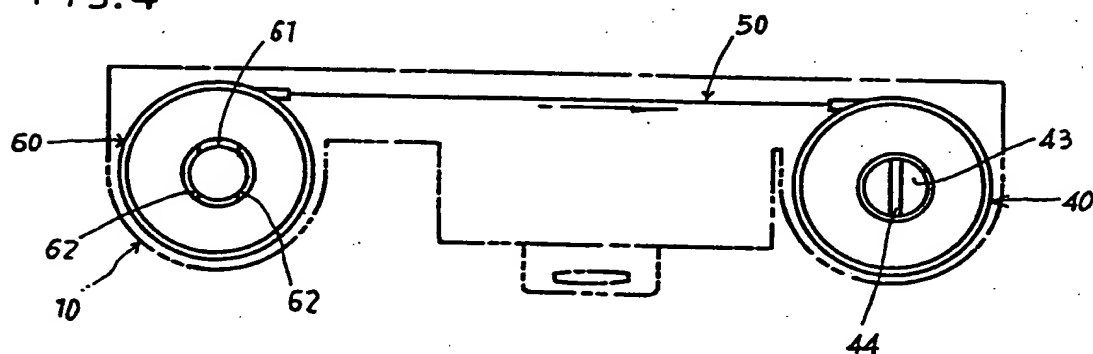
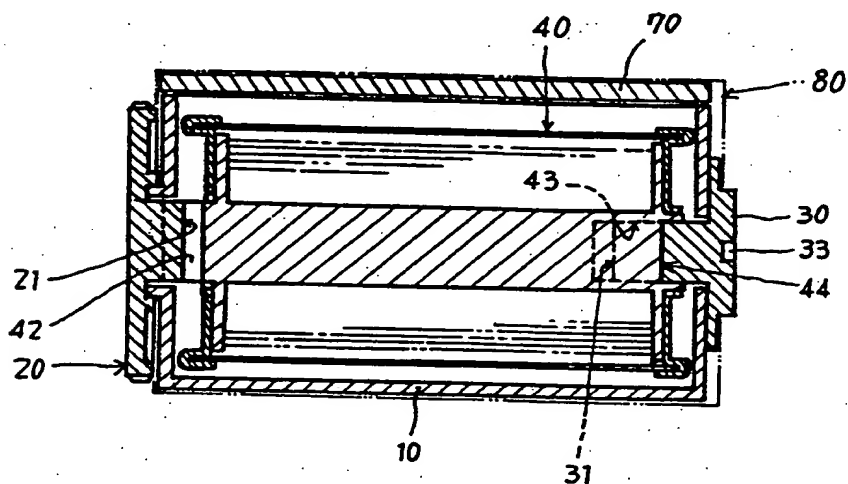


Fig. 5



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Fig. 6

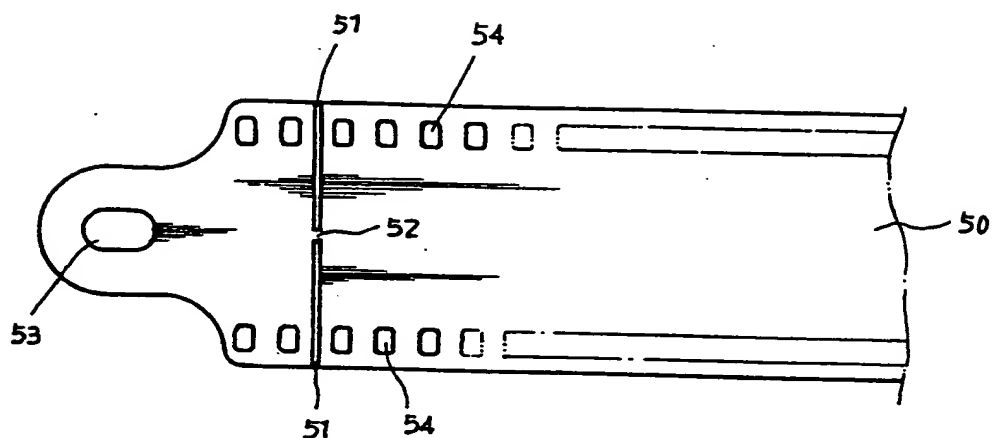


Fig. 7

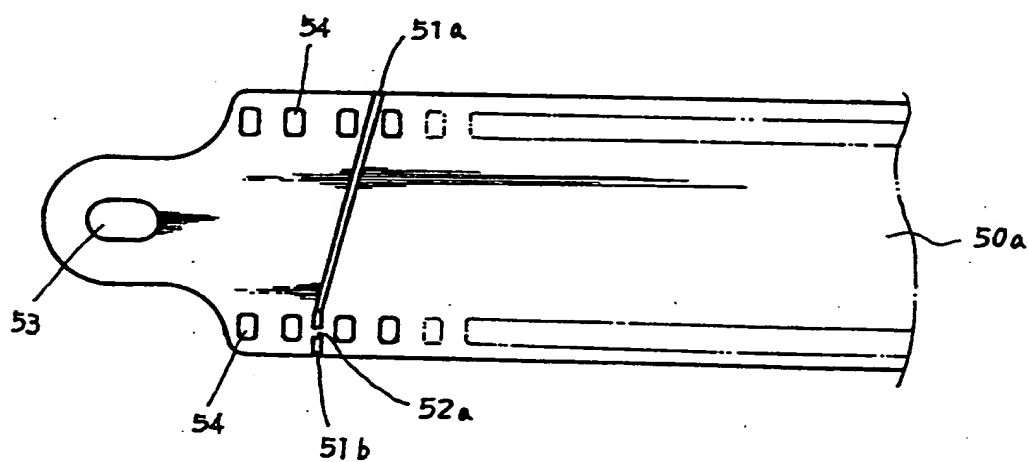
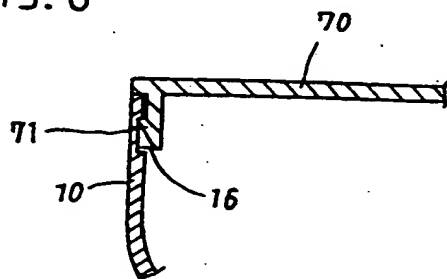


Fig. 8





# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR 98/00156

## A. CLASSIFICATION OF SUBJECT MATTER

IPC<sup>6</sup>: G 03 B 17/00; G 03 B 1/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

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IPC<sup>6</sup>: G 03 B 17/00; G 03 B 1/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 682 571 A (BALLING) 28 October 1997 (28.10.97), fig.2; lines 47 - 66.	1,4
Y	JP 09 133 954 A (OLYMPUS) 20 May 1997 (20.05.97), whole abstract.	1,4
Y	US 5 452 033 A (BALLING) 19 September 1995 (19.09.95), fig.8; column 9, lines 11 - 39.	1,4
Y	US 4 472 038 A (MURAMATSU) 18 September 1984 (18.09.84), figs.; column 4, lines 33 - 37; column 5, lines 14 - 33.	1,4
Y	US 5 608 486 A (TAKAGI) 04 March 1997 (04.03.97), figs.; abstract; claims.	1,4
A	WO 87/01 469 A1 (HOFFMAN) 12 March 1987 (12.03.87), fig.4,5,8; page 8, lines 4 - 10, 23 - 28; claim 19.	1-4

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search

29 January 1999 (29.01.99)

Date of mailing of the international search report

23 July 1999 823.07.99)

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In Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche		Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
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